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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/936,999	02/19/2002	Yoshiaki Nakamura	501.40631X00	2964
20457	7590	05/04/2005	EXAMINER	
ANTONELLI, TERRY, STOUT & KRAUS, LLP 1300 NORTH SEVENTEENTH STREET SUITE 1800 ARLINGTON, VA 22209-3873			CALEY, MICHAEL H	
			ART UNIT	PAPER NUMBER
			2871	

DATE MAILED: 05/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/936,999	Applicant(s) NAKAMURA ET AL.	
	Examiner Michael H. Caley	Art Unit 2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12/22/04, 1/24/05.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 4-6, 10-16, 19 and 20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 4-6, 10-16, 19 and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

Claim 10 objected to because of the following informalities:

Claim 10 line 6: "liquid diffusing layer" should be replaced with --light diffusing layer--

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4, 6, 10, 11, 13, 14, 16, 19, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuo (U.S. Patent No. 6,144,430) in view of Aoyama (U.S. Patent No. 5,663,777) and Epstein et al. (U.S. Patent No. 6,801,276 "Epstein").

Regarding claim 4, Kuo discloses a liquid crystal display device having:

a liquid crystal display panel (Figure 3) which sandwiches a liquid crystal layer (Figure 3 element 309) between a first substrate (Figure 3 element 305) and a second substrate (Figure 3 element 306), a metal reflecting layer (Figure 3 element 304) which is mounted on the first substrate and reflects light, and a light diffusing layer (Figure 3 element 303) which is mounted on the second substrate, the light diffusing layer having a light diffusing material made of particles (Column 3 lines 47-53).

Kuo is silent on the kind of material used for the particles and the spectral characteristics of the light diffusing layer and the metal reflecting layer. Epstein, however, teaches a light diffusing layer having light diffusing material made of organic particles wherein the transmission spectral characteristics of a visible light region are of a flat type (Figure 3 element 308; Figure 6E element 617; Column 8 lines 4-8). Epstein teaches such a diffusion layer as advantageous to increase the viewing angle of the device and to make intensity variations less visible to the viewer (Column 1 lines 15-19). Aoyama teaches a metal reflecting layer wherein the reflection spectral characteristics of a visible light region are of a flat type (Figure 11 elements 93-95; Column 15 line 3 – Column 16 line 5). Aoyama teaches such a metal reflecting layer as advantageous to increase the brightness of the display while minimizing fluctuation of reflectance at various wavelengths.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed the light diffusing layer and metal reflecting layer disclosed by Kuo such that the transmission spectral characteristics be of a flat type by means of the diffusing layer having organic particles and the reflection spectral characteristics be of a flat type. It is a general design goal in the art to construct metal reflecting layers and diffusers such as disclosed by Kuo to have uniform transmittance and reflectance characteristics across the range of visible light. Uneven spectral characteristics of such elements are known to disrupt the desired color tone by undesirably tinting the displayed colors. Aoyama, for example, teaches a preferred deviation between wavelengths as within the range of 0% to 6% (Column 15 line 3 – Column 16 line 5). One would have been motivated to construct the diffusing and reflecting elements disclosed by

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Kuo to have spectral characteristics of a flat type to display an image having optimal color tone and high brightness across all visible wavelengths.

Regarding claim 6, Kuo as modified by Aoyama and Epstein discloses color filter films as provided to an inner surface of either one of the first substrate or the second substrate (Column 3 line 32).

Regarding claims 10 and 13, Kuo as modified by Aoyama and Epstein discloses a difference between the maximum and the minimum of a transmittance of the light diffusing layer and the reflectance of the metal reflecting layer as not larger than 20% in a visible light region (Aoyama: Figure 11 elements 93-95; Epstein: Figure 6E element 17).

Regarding claim 11, Kuo as modified by Aoyama and Epstein discloses the transmission spectral characteristics of a visible light region of the light diffusing layer as made to match the reflection spectral characteristics of a visible light region of the metal reflecting layer (Aoyama: Figure 11 elements 93-95; Epstein: Figure 6E element 17).

Regarding claims 14, 16, and 19, Kuo as modified by Aoyama and Epstein discloses the light diffusing layer as including an adhesive agent into which light diffusion material is mixed (Epstein: Column 7 line 66 – Column 8 line 16).

Regarding claim 20, Kuo as modified by Aoyama and Epstein discloses the diameter of the light diffusing material as in a range of 3 microns to 10 microns (Column 8 lines 4-8).

Claims 5, 12, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuo in view of Aoyama and Epstein and in further view of Nakabayashi et al. (U.S. Patent No. 6,379,017 “Nakabayashi”).

Kuo as modified by Aoyama and Epstein fails to disclose an auxiliary light source for illuminating an upper surface of the liquid crystal display panel and an input device for inputting data as arranged over the light diffusing layer. Nakabayashi, however, teaches an auxiliary light source and input device as arranged over a reflective liquid crystal display (Figure 39; Column 31 line 62 – Column 32 line 13), such as disclosed by Kuo.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have arranged an auxiliary light source and input device over the diffusing layer as proposed. Nakabayashi teaches the auxiliary light source as advantageous to enable screen display for use of the display in areas of insufficient light (Column 1 lines 20-27). Furthermore, Nakabayashi teaches the input device as advantageous to allow the user of the display to conveniently input data by finger or pen (Column 31 lines 62-65). One would have been motivated to arrange the light source and input device over the diffusing layer to allow for versatile use of the display device as a personal digital assistant (PDA) similar to conventional devices of the art. Likewise, a PDA may be implemented advantageously in a reflective display as disclosed by Kuo due to its ability to make use of ambient light to conserve energy.

Response to Arguments

The rejection of claims 4-6, 10-16, 19, and 20 under 35 U.S.C. 112, first paragraph, is withdrawn. Epstein and Aoyama show that the spectral characteristics of the diffusing and reflective layers described in the specification may have been attained through conventionally known techniques.

Applicant's arguments with respect to the rejection of claims 4, 10, 11, 14, and 17-20 as unpatentable over Iwata in view of Miyamoto have been considered but are moot in view of the new ground(s) of rejection. It is noted, however, that Miyamoto provides a teaching applicable to diffusers and reflective elements of liquid crystal displays generally in that it is advantageous to produce spectral characteristics of a flat type in these elements to achieve an optimal color tone (Column 1 line 66 – Column 2 line 7, Column 3 lines 23-30). Although the specific structure of the elements taught by Miyamoto differs from the elements taught by Iwata and would therefore not be physically combinable, it would be inappropriate to ignore such teachings in a determination of patentability (MPEP 2145 [R-2] III).

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael H. Caley whose telephone number is (571) 272-2286. The examiner can normally be reached on M-F 8:30 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Michael H. Caley

April 29, 2005

mhc

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